Comments
cbhy-0015

KAISER ALUMINUM

KAISER ALUMINUM & CHEMICAL CORPORATION

June 17, 2002

Hylebos NRDA Settlement Proposal Comments
NOAA Damage Assessment and Restoration Center NW
7600 Sand Point Way NE
Seattle, WA 98115-0070
Attn: Gail Siani

Re: Hylebos Waterway Natural Resource Damage Settlement Proposal Report

Dear Ms. Siani:

Submitted with this letter are Kaiser Aluminum & Chemical Company's comments regarding the above-referenced report ("Settlement Proposal"). At the outset, Kaiser would like to commend the Trustees in this effort to achieve settlement so that costly and protracted litigation can be avoided. Kaiser also appreciates that PRPs and the public have been given the opportunity to comment on the Settlement Proposal.

Taken as a whole, the enclosed comments encompass two primary objectives. First, Kaiser identifies technical and scientific drawbacks in the Proposal that present potential impediments to settlement. Second, we suggest how the Settlement Proposal could be modified to overcome these difficulties to achieve a scientifically valid and equitable result. It is our belief that such modifications are necessary for the Settlement Proposal to effectively reach its goal of a waterway-wide settlement.

As part of our comments, Kaiser is providing additional technical information relevant to the Trustees analyses of injury and allocation. Also, to further the goal of an equitable allocation, Kaiser has included operational summaries prepared by TLI Systems to support the remediation cost allocation. The summaries are provided in an attachment to these comments and include all properties on the Waterway. The information contained in Kaiser's summary is based on legitimate operational data validated in the TLI Systems allocation. If the Trustees receive any documents that contain significant information contradictory to Kaiser's operational summary, we request an opportunity to review and respond to such information.

TACOMA PLANT
3400 TAYLOR WAY, TACOMA, WASHINGTON 98421 PHONE (253) 383-1461

If the Trustees have questions regarding these comments or the attachments, please contact me at (509) 242-1079.

Very truly yours,

for Charles L. Preston
Environmental Projects Manager

enclosures

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KAISER ALUMINUM & CHEMICAL COMPANY COMMENTS RE HYLEBOS WATERWAY NATURAL RESOURCE DAMAGE SETTLEMENT PROPOSAL REPORT

Below are Kaiser's comments on the Trustees' draft Hylebos Waterway Natural Resource Damage Settlement Proposal Report ("Settlement Proposal"), dated March 2002. These comments first focus generally on the technical and scientific foundation of the Settlement Proposal. Second, specific technical and science-based comments are explored in detail and presented with relevant attachments.

GENERAL COMMENTS

Trustee Manipulation of Data Is Unjustified And Results In Severely Biased Data.

The Trustees' assignment of factors to increase HCC data is not technically valid and is simply wrong. As explained below in Comment 1, the quality control method of analyzing a standard reference material to assess the data was arbitrarily modified by the Trustees to fit their own data. The standard reference material (SRM 1941) was established by the National Institute of Standards and Technology (NIST) to standardize analyses of sample chemistry. The fact that the Trustee data do not conform to the standard demonstrates that their sampling method was faulty. The fact that the HCC data did conform to the standards proves that their data are valid. To maintain otherwise is untenable and undermines the legitimacy of the Settlement Proposal. We strongly encourage the Trustees to correct this unjustified oversight.

Threshold Injury Levels Are Too Low.

The injury levels established by the Trustees are erroneously low for several reasons. Most importantly, the AET-based threshold levels developed by the Trustees are not TOC normalized or adjusted in accordance with bioassay data. As explained in considerable detail below, the Trustees must correct these shortcomings before scientifically valid AET-related injury thresholds can be determined. Given that the AET threshold levels are the cornerstone of the Settlement Proposal, these levels must be scientifically sound to the extent possible. Without fundamental assurances of validity, PRPs will have great difficulty in justifying a settlement under this Proposal.

Trustees Should Incorporate Supplementary Technical And Scientific Data Received Through The Public Comment Process.

Kaiser recommends that the Trustees incorporate technical and scientific supplementary information into its allocation analyses. Accordingly, if new data

invalidate an assumption used by the Trustees in their analyses, that assumption should be corrected. For example, as described below, Kaiser has provided the Trustees with a sediment trend analysis specific to Hylebos Waterway (see Comment 8). Because this analysis is site-specific and independently conducted, the Trustees should use this data in lieu of its faulty assumption of a bi-directional distribution of sediment. Further, additional information as to diminished habitat is provided (see Comment 7) that is based on highly relevant and thorough studies conducted by the Wood Debris Group. Such data should be utilized by the Trustees to further refine and substantiate the technical basis of their Proposal.

Also provided with these comments are operational summaries for all properties adjacent to the Hylebos Waterway as compiled by TLI Systems in support of the remediation cost allocation. See Attachment 9. The data and conclusions presented in these summaries are based on relevant data from agency files, company operational files, full disclosure (by participating PRPs) and interviews with the operators themselves. The summaries are condensed from detailed operational profiles that were developed for all parties. This information represents the most complete data compilation available as to each individual operation on the waterway. Although TLI Systems used different allocation criteria from that used in the Settlement Proposal, the same type of operational data forms the basis for both allocations. Thus, the Trustees should review these operational summaries and, to the extent necessary, incorporate relevant information into the NRD allocation to achieve consistency between allocations.[1]

Risk of Project Failure and Adaptive Management Should Be Borne By the Trustees

The Trustees' Settlement Proposal expects PRPs that build projects to resolve their NRD liability to also assume risk for project failure and adaptive management. While the PRPs should be expected to meet performance standards in building and completing NRD projects, long-term liability for project performance is unreasonable and could add considerable cost to a project. Restoration projects are considerably different from remediation projects that employ predictable engineering controls. Once restoration projects are built, nature plays a significant and often unpredictable role in its success. Moreover, the Trustees themselves select and assist in the design of these projects. Logically,

[1] The Trustees should note that the U.S. Government and Olin Corporation should be added as additional parties to the Weyerhaeuser and Lone Star Northwest properties. Also, the Trustees are encouraged to review the Ohio Alloys (Taylor Way Properties) operations summary for additional information as to PAHs and PCBs.

it is the Trustees that should be responsible for the long-term stewardship and risk for project performance and unforeseen natural consequences.

Discount Factors Are Erroneously Applied to Projects and Natural Recovery Areas

The years necessary for natural recovery and project effectiveness are over estimated by the Trustees in many instances. Faster recovery time has been documented at several locations both in the Commencement Bay area and Puget Sound generally. Thus, Kaiser recommends that Trustees allow PRP project proponents flexibility to demonstrate that project habitat recovers more rapidly than assumed in the Proposal so that PRPs receive appropriate DSAY credit.

SPECIFIC COMMENTS

1. **The Trustees' assignment of factors to increase non-Trustee data is based on a flawed presumption of data superiority that converts real data into biased data.**

For purposes of data quality control, certified concentrations of reference samples are established independently by the National Institute of Standards and Technology (NIST). The data quality control method used for the Trustee data involved analysis and comparison of the results for Standard Reference Material 1941 (SRM 1941) for which NIST employs a mean and 95% confidence interval. When using SRM 1941, the Trustees' multiple analyses of a certified standard reference material exceeded the certified mean plus the 95% upper confidence limit by up to 43.8 percent.[2] Rather than correcting their methodology in accordance with quality control standards, the Trustees expanded confidence limits to fit their own data. Thus, in Table 2D-p1 of the Trustees' data included in Attachment 1, the UCL and LCL are defined as the mean plus or minus the 95% confidence interval plus or minus an additional 35%. These manipulated confidence limits are the limits against which the Trustees assessed their data. If the Trustees were to compare their analysis for the SRM 1941 to the appropriate 95% confidence interval instead of ± 35% around that confidence interval, the high bias of the Trustees' data would be obvious.

[2] The following discussion is condensed from comments by the HCC to EPA regarding the Trustees' chemical data. Those comments are attached in their entirety at Attachment 1.

To demonstrate our point, the table below compares the six analyses of the SRM used in the Trustees' data to the valid NIST certified concentrations.

Sample Number	Analyte	Mean plus 95% Conf. Int. (ug/kg)	Trustee Result (ug/kg)	Trustee Data: Percent above Certified Mean plus 95% Conf. Int.
110-072	Phenanthrene	636	740	16.4%
	Fluoranthene	1460	1600	9.6%
	Pyrene	1280	1500	17.2%
	Benzo(b)fluoranthene	1463	1700	16.2%
110-091	Phenanthrene	636	740	16.4%
	Anthracene	244	260	6.6%
	Fluoranthene	1460	1700	16.4%
	Pyrene	1280	1500	17.2%
	Benzo(b)fluoranthene	1463	1800	23.0%
110-111	Phenanthrene	636	910	43.1%
	Anthracene	244	320	31.1%
	Fluoranthene	1460	2000	37.0%
	Pyrene	1280	1700	32.8%
	Benzo(a)anthracene	629	660	4.9%
	Benzo(b)fluoranthene	1463	1900	29.9%
	Indeno(1,2,3-c,d)pyrene	609	700	14.9%
	Benzo(g,h,i)perylene	599	640	6.8%
110-130	Phenanthrene	636	900	41.5%
	Anthracene	244	310	27.0%
	Fluoranthene	1460	2100	43.8%
	Pyrene	1280	1800	40.6%
	Benzo(b)fluoranthene	1463	1700	16.2%
	Indeno(1,2,3-c,d)pyrene	609	620	1.8%
110-155	Phenanthrene	636	810	27.4%
	Anthracene	244	270	10.7%
	Fluoranthene	1460	1700	16.4%
	Pyrene	1280	1500	17.2%
	Benzo(b)fluoranthene	1463	1700	16.2%
110-189	Phenanthrene	636	780	22.6%
	Anthracene	244	270	10.7%
	Fluoranthene	1460	1700	16.4%
	Pyrene	1280	1500	17.2%
	Benzo(b)fluoranthene	1463	1700	16.2%
	Indeno(1,2,3-c,d)pyrene	609	660	8.4%
	Benzo(g,h,i)perylene	599	630	5.2%

The above table demonstrates the high bias to the Trustee's data, especially as to PAHs. If valid quality control methods were applied to the Trustees' data, the HCC data would not require modification. Spreadsheets prepared by Kaiser, presented in Attachment 2, illustrate adjusted service losses for each contaminant

after Trustee correction factors are removed. Table 1 identifies the service losses assigned to each station by the Trustees. Table 2 shows the service losses after removing the Trustees' unwarranted correction factors (including "U" qualified data). As indicated in the spreadsheets, elimination of Trustee correction factors significantly reduces the amount of services lost.

2. <u>Since Apparent Effects Thresholds ("AETs") do not show cause and effect relationships, bioassay data should be used to override the sediment chemistry results.</u>

The Trustees erroneously use AETs to establish theoretical dose-response relationships, i.e., cause and effect relationships, and corresponding threshold injury levels. Utilizing AETs in this manner is unsupportable and contrary to accepted practice of EPA and Ecology, and the recommendations of the Science Advisory Board ("SAB"). AETs were originally developed by EPA during preparation of the RI/FS to establish cleanup standards for use in Commencement Bay. To assist this effort, EPA requested that the SAB review and critique the AET methodology.[3] At the same time, AET methodology was being evaluated by the State of Washington for use in developing state sediment management standards. Thus, the SAB assessment of AETs informed both agencies' decisions.

After extensive review, SAB concluded that the usefulness of AETs is limited in that AETs are indicative only of apparent effects. The SAB specifically acknowledged that

> *the AET approach should not be used to develop general, broadly applicable sediment quality criteria. Some major limitations drive this opinion, including the site specific nature of the approach,* ***its inability to describe cause and effect relationships****, its lack of independent validation, and* ***its inability to describe differences in bioavailability of chemicals on different sediments.***

[3] In 1988, EPA Region 10 requested the SAB to come to Seattle to review and critique the AET methodology. The SAB conducted a two day meeting in Seattle to obtain input from agencies and other interested parties. After careful scrutiny, the SAB issued a report in 1989 setting forth its conclusions and recommendations. This report is entitled Report of the Sediment Criteria Subcommittee Evaluation of the Apparent Effects Threshold (AET) Approach for Assessing Sediment Quality. SAB-EETFC-89-027. July 1989. A full copy of the SAB report is appended to these comments at Attachment 3.

See, Attachment 3, Cover Letter to SAB Report (emphasis added). To compensate for these limitations and upon recommendations directly from the SAB, both Ecology and EPA incorporated bioassay overrides of AETs as an integral part of their respective cleanup standards.

Also especially pertinent to the Hylebos Waterway, the SAB further noted that

> ... ***in situations where the complex mixture changes in composition rather than concentration or where the chemicals measured do not vary proportionally with the concentrations of the substances responsible for the effects, AETs will be faulty predictors of biological impacts of complex mixtures.***

Attachment 3 at 10. Because complex mixtures of contaminants vary widely throughout Hylebos sediments, AETs are faulty predictors of impacts in the waterway. Consequently, given that AETs 1) do not establish cause and effect relationships, 2) lack independent validation, 3) do not consider bioavailability, and 4) do not accurately predict impacts in Hylebos sediment due to the complex mixture of contaminants, the Trustees must change their approach in developing threshold levels. To promote credibility of the Settlement Proposal, we strongly advocate that the Trustees adopt the practices of EPA and Ecology by using site-specific bioassay data to override AETs and determine valid injury threshold levels accordingly.

3. Hylebos Waterway site-specific bioassay data is the best predictor of biological impact and should be used to determine threshold levels.

HCC has collected considerable bioassay data from Hylebos Waterway sediments which are obviously relevant to determination of injury levels.[4] Inexplicably, the bioassay data have been disregarded by the Trustees. Consideration of this data and adjustment of injury levels where bioassay data override chemistry would go a long way towards establishing rationally-based injury levels.

Under the ROD and the Sediment Management Standards, if sediments pass three bioassays tests, the sediment is considered clean even if contaminants

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[4] The HCC and Trustee Bioassay data are graphically summarized in Attachment 4.

present are in concentrations above the AET-based cleanup standards. To illustrate the effect bioassay data would have on proposed service levels, station bioassay results are compared below to PAH service losses also respectively assigned to the that station. The following sediment stations passed the amphipod, echinoderm and *Neanthes* bioassays, yet were assigned high impact injury levels.

1117	80% service loss by PAHs
1203	60% service loss by PAHs
HY-19	60% service loss by PAHs
3211	60% service loss by PAHs
3214	60% service loss by PAHs
4116	60% service loss by PAHs
HY-20	40% service loss by PAHs
HY-21	40% service loss by PAHs
HY-22	40% service loss by PAHs

The "HY" designated stations above also had benthic assessments conducted. All of these benthic assessments passed scrutiny. Given the overwhelming site-specific evidence of no impact in these sediments, none of the above stations warrant assignment of service loss levels due to PAHs, especially at 60% and 80% levels. At the 60% and 80% service loss levels, App. D, Fig. 1 of the Proposal states that it assumes <u>all</u> invertebrates are affected. Thus, the bioassay data directly refute this assumption.

In addition to the service losses erroneously applied to the above stations, several additional stations were also assigned a 60% or 80% service loss yet passed some of the bioassays. Thus, bioassay data for those stations also refute the assumption that <u>all</u> invertebrates are affected at these levels. App. D. Fig. 1 further asserts that at the 40% service loss level, "One-half of tested invertebrates [are] affected." However several stations assigned the 40% service loss level passed bioassays including the echinoderm and *Neanthes* tests. Although the echinoderm and *Neanthes* bioassays are assumed to be especially sensitive to PAHs (these tests are assigned very low AETs), the sediments passed the bioassays. Consequently, site-specific data also soundly refute the assumptions underlying the 40% service loss levels set for PAHs.

Numerous additional subtidal and intertidal stations that contain varying mixture of other contaminants and varying concentrations of PAHs also passed all three bioassays and benthic assessments. Consequently, site-specific bioassay data also refute the service loss assumptions for all contaminants contained at these stations. These stations are identified as follows:

HY-3, HY-5, HY-10, HY-12, HY-15, HY-16, HY-18, 1122, 1144, 1208, 1210, 2105, 2119, 2208, 2212, 3206, 3210, 3213, 3215, 4117, 4119, 5102, 5107, 5112, 5213, 5503, 5505 and 5508.

Additionally, because several stations throughout the waterway had very low concentration of PAHs and/or other contaminants and were determined to be below cleanup standards, no bioassay data for these stations were collected. Nonetheless, the Trustees assign service losses to many of these stations. Thus, despite the lack of bioassay data, these stations should either be assigned no service loss or very low service loss levels if sediment chemistry is similar to stations that pass bioassays.

4. <u>Dry weight normalized AETs should be organic carbon normalized to properly reflect bioavailability of contaminants in sediments.</u>

The SAB strongly encourages the use of organic carbon normalization when developing AET values to account for bioavailability of sediment contaminants. In its Report, the SAB succinctly explains its position by recognizing that a

> *large amount of data exists in the literature, from both laboratory and field studies, demonstrating the utility of carbon normalization for relating the bioavailability of non ionic organic chemicals sorbed to sediments. These data indicate that the free form of the chemical which is available for organism uptake, whether by ingestion or by transport across respiratory and external membranes, can best be approximated by carbon normalization of the measured sediment chemical concentrations. . .*
>
> *The use of this approach is consistent with theory and it provides an AET which is based on mass of chemical per mass of carbon. In practice, converting a carbon-normalized AET for a specific chemical into non-normalized concentrations results in a range of (AET) values depending upon the value of carbon that is used to make the conversion. . . Carbon normalization does not assume that all sediments are equal. The same sediment chemical concentration detected in a range of different sediments may or may not exceed the AET depending on the TOC of the sediment. The use of TOC-normalized values in the above manner should eliminate the criticism that the AET approach is insensitive to differences in sediment types and differences in bioavailability.*

Attachment 3 at 11-12.

As the SAB clearly states, waterway sediment data must be TOC normalized to establish valid biological effects threshold levels. Normalizing the data for organic carbon is especially relevant to PAHs. In fact, most stations in Hylebos Waterway pass the state's PAH sediment management standards which are based on OC normalized AETs. These standards, as set forth in Ecology regulations, represent levels that result in no adverse impact. Nonetheless, the Trustees refuse to normalize for organic carbon and as a result claim that PAHs impact 177 out of 183 sediment stations.

5. <u>The Settlement Proposal mistakenly relies on state guidance to support its use of dry weight AETs instead of TOC normalized AETs.</u>

The Trustees choose to ignore strongly worded recommendations from the SAB and Ecology to TOC normalize sediment samples when utilizing AETs in its analyses. The Trustees claim that their decision to use dry-weight AETs

> *is based on concern that the total carbon content of some sediment samples from Hylebos Waterway is artificially elevated from some human activities that result in deposition of organic substances (e.g., petroleum hydrocarbons, wood chips, etc). OC normalization of these carbon-enhanced sediment samples may result in inappropriately low normalized values (Michelsen, 1992).*

Settlement Proposal, App. D. p. 3. Thus, because the organic carbon in sediments may be in part artificially elevated due to human activity, the Trustees decided to ignore OC normalization completely. However, the guidance cited by the Trustees as a basis for its decision does not recommend that OC normalization be disregarded in these circumstances. Rather the guidance states that

> *in areas where the TOC is very low or very high,* ***biological testing or use of dry weight concentrations should be considered along with the OC-normalized concentrations in evaluating the extent of contamination and potential biological effects . . .*** *if the organic chemicals or substances that are the primary contributors to the elevated TOC levels are known, the contribution of the organic contaminants to the percent TOC may be determined through analytical methods and subtracted from the TOC value before OC normalizing.*

Michelsen (1992) at 8 (emphasis added). This guidance document is attached to these comments as Attachment 5.

An increasing trend in organic carbon content is expected to naturally occur from the mouth to the head of an embayment such as the Hylebos Waterway. Figure 5-20 in the Final Event 1A and 1B data report illustrates the increasing trend of TOC from the mouth to the head of the waterway. See Attachment 6. Generally, the data indicate that the outer third of the waterway has TOCs mostly in the 0 to 3 percent range, the middle third of the waterway has TOCs mostly in the 3 to 4.5% range, and the inner third of the waterway has TOCs mostly in the 4.5 to 6% range. This is not an unusual distribution of TOC for this type of embayment, and the ranges are well within the ranges of TOC that the SAB specifically discussed when emphasizing the need for TOC normalization. Those areas elevated above 6% in the neck and the head of the waterway correspond to areas with large amounts of wood debris as identified by the Wood Debris Group in their reporting. In these specific areas, a reasonable adjustment to reflect the presence of wood debris would be to lower the TOC to 5% to be consistent with the segment average. Similarly for the few elevated TOC stations in the outer part of the waterway, lower TOC values of 3 to 4% could reasonably be applied. These data demonstrate that adjustments to TOC values to reflect OC from human activities is quite feasible. There simply is no scientific or technical basis for the Trustees default to use of dry weight AETs under these circumstances.

TOC normalization with respect to PAH and PCB AETs is critical. The dry weight AETs for various PAHs and PCBs only equal the OC-normalized AETs when the TOC is in the 1.5 to 2% range. As described above, the TOC is significantly higher throughout the waterway and especially in the head of the waterway. Thus, the Trustees reliance on dry weight AETs significantly overstate service loss as to PAHs and PCBs. This conclusion is validated by site-specific bioassay data. As discussed above, dry weight AETs cannot be used as stand alone criteria broadly applied as they are faulty predictors of biological impact in complex mixtures of varying composition, do not reflect cause and effect relationships and do not consider bioavailability of contaminants.

6. SAB recommendations as to OC normalization are relevant to fish as well as to invertebrates.

The fish based PAH thresholds established by the Trustees ignore organic carbon normalization concerns. The summary of effects on fish from PAHs set forth in the Johnson (2000) paper does not refer to organic carbon considerations except where it briefly states that

> *the sediment PAH threshold below which no significant carcinogenic or adverse reproductive effects in English sole are observed is estimated to be 1000 ppb (ng/g dry wt), or*

approximately 50 mg/kg total organic carbon (TOC), ***assuming a sediment TOC content of 2%,*** *a fairly typical value for Puget Sound sediment (Michelsen and Bragdon-Cook 1993).*

Johnson (2000) paper at 18 (emphasis added).

The above statement is not based on any studies that evaluate organic carbon normalization to determine the threshold for adverse reproductive effects in English sole. Rather, using only dry weight values, an organic carbon normalized equivalent was assumed to be 2% TOC. Such an assumption may be a fair representation of sediments where NOAA conducted its fish-PAH studies. However, it is not a fair representation of the TOC conditions throughout Hylebos Waterway. Nonetheless, such an assumed TOC normalized value would at the very least require increase of the fish sublethal effects threshold to 2000 ppb total PAH where the TOC is 4% and 3000 ppb total PAH where the TOC is 6%.[5]

7. <u>Kaiser should not be assigned an allocation for PCBs.</u>

The appropriate "standards" for PCBs, whether benthic AETs or fish effects, are not fixed numbers, but are instead a ratio between PCB concentration and TOC. Thus, as TOC increases, the PCB dry weight concentration equal to the standard must also increase.[6] The Trustees have erroneously failed to incorporate

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[5] Further, it appears unlikely that the potential affect of TOC was considered in studies establishing fish sublethal effects 2, 3 and 4. To correct this problem, each of these thresholds should be converted to a TOC normalized value assuming the dry weight values represent effects level at 2% TOC to be consistent with fish sublethal effect 1

[6] If a standard is based on a relationship to another substance it must be implemented based on that relationship where it occurs. Agencies that attempt to simplify a relationship based standard to a single number will make serious mistakes in implementation. A good example of this occurred when Washington, Idaho and EPA were preparing a total maximum daily load for metals as to the Spokane River. The metals standards are hardness dependent. Nonetheless, the agencies took the hardness value for the river when it was softest, applied it to the formula and converted a relationship based standard to a single fixed concentration. However, the dischargers had source waters that were much harder than the surface water and, thus, met the metals standards at the end of pipe once the relationship was properly considered. The agencies eventually had to concede that they were in error and the TMDLs were revised to recognize the effluent hardness. The identical concern exists with the Settlement Proposal because the effects of PCBs and PAHs in sediments are dependent on the total organic carbon content of the sediment, and dry weight effects levels will vary in direct proportion to the organic carbon content.

this concept into their PCB (or PAH) standards. If the Trustees were to make appropriate corrections to integrate TOC normalization, bioassay results, and remove unfounded factors assigned to amplify HCC data, the Trustee would find that the footprint approach to allocation should replace the current area-wide approach. Under a footprint analysis, Kaiser would not be allocated any PCBs. This result would be consistent with the findings of TLI Systems that Kaiser's contribution to PCB contamination in the waterway is negligible. (See Kaiser operations summary, Attachment 9).

8. **Adjustments to service losses for contaminants at each station after correction for TOC normalization and consideration of bioassay data are illustrated and attached to these comments.**

The tables in Attachment 2 document the changes to service losses for each contaminant and each station to reflect necessary corrections as discussed in these comments. The tables provide information on TOC normalized AETs and fish thresholds, show TOC normalization calculations, and identify stations with bioassay data.

Table 1 (discussed above in Comment 1) presents the service losses for each contaminant for each station as developed by the Trustees'.

Table 2 (discussed above in Comment 1) presents the service losses after removing "U" qualified data and removing the Trustees' inappropriate correction factors.

Table 3 presents the TOC normalized AET values from the Department of Ecology.

Table 4 presents the PAH TOC normalized AET and Fish based thresholds and assigned service losses following the Trustees' approach.

Table 5 presents the PCB TOC normalized AET and Fish based thresholds and assigned service losses following the Trustees' approach.

Table 6 presents the PAH and PCB TOC normalization calculations and service loss assignments. The TOC normalization is performed using two different approaches. The TOC normalized data are first computed based on a simple assignment of 5%, 4%, 3%, 2% and 1% TOC for HCC stations numbered in the 1000s, 2000s, 3000s, 4000s and 5000s respectively. Trustee stations were similarly assigned in accordance to nearby HCC stations. This rough assignment is supported by the TOC distribution figure that was presented in Attachment 5. Next, the TOC normalized data were computed based on the actual TOC measured

at each station. TOC normalized AETs were obtained from Ecology and used along with the TOC normalized fish based thresholds to establish service loss.

Table 7 presents the results of bioassays and benthic population assessments for stations in Hylebos Waterway.

Table 8 presents the service losses for each contaminant and each station as in Table 2, but corrects for using TOC normalized data and thresholds for PAHs and PCBs. Similar corrections should be made for other non-polar organic compounds as well.

Table 9 presents the service losses for each contaminant and each station as in Table 8, but corrects for stations based on bioassay results.

These tables collectively demonstrate how correction of biased data, TOC normalization, and bioassay data directly modifies the Trustees' determination of threshold injury levels.[7] These adjustments are strongly recommended so that the Trustees' can promote an allocation that is technically and scientifically rational. Only under such circumstances, are PRPs likely to feel comfortable enough with the result to go forward with settlement.

9. <u>The assignment of losses for PAHs based on effects on fish are exaggerated and should be reduced.</u>

Dr. Gary Marty, after reviewing the Johnson Report (2000), prepared a general synopsis of the quality of the work and specific comments as to the Report's conclusions. His comments are submitted here as Attachment 10. Dr. Marty notes that the Johnson Report states a cause and effect relationship between cancer and sediment PAHs even though a link has not been confirmed under controlled laboratory conditions. Further, the Johnson Report presents other reports as demonstrating causation when in fact they only present correlations. Dr. Marty also concluded that the evidence is weak for a link between adverse fish health effects and alterations in growth. Only one study of wild English sole documented increased growth in fish at a site extremely contaminated with PAHs. In addition, only one study of PAH-effects on English sole growth (peer-reviewed literature) reported no significant differences in one of two experiments. Furthermore, the Report's statements linking PAH contamination to reproductive

[7] To the exasperation of Kaiser, Trustee data limitations prevent our determination of how DSAYs are reduced as a result of these modifications. It's frustrating that input parameters are put into a black box and then spit out again in DSAYs.

abnormalities fail to adequately recognize the potential impact of other co-occurring contaminants such as PCBs and DDTs.

Table 9 in Attachment 2 presented the percent service losses for each contaminant and sediment station after removing the Trustees' correction factors, after removing "U" qualified data, after correcting for TOC normalization and after considering where bioassay data refutes the chemistry. The percent service losses for PAHs should be further reduced because the magnitude of the fish losses assigned are not adequately substantiated by the Johnson Report or otherwise by the Trustees.

10. The area assigned diminished habitat value in Segments 1 & 2 should be increased to more appropriately reflect baseline.

Based upon the excel spreadsheet "Hylebos02" provided by NOAA, it appears that the total acreage in Segment 1 assigned a diminished habitat value is 12.9 out of a total of 44.6 acres. Similarly, the area in Segment 2 assigned a diminished habitat value is 3.8 acres out of a total of 39.5 acres. Habitat was considered diminished in these areas due to the presence of shorefast docks, log rafts or greater than 50% wood debris However, the areas designated in Segments 1 and 2 as diminished are under-represented due to under-estimation of log rafting and handling areas, areas of wood debris, and failure to recognize permanently moored platforms as diminished habitat areas. Each of these diminished habitat areas are discussed separately below.

Log Rafting and Handling Areas:

Figure 5.1 from the Events 1A and 1B Data Report prepared for the Hylebos Wood Debris Group (Attachment 7) shows that the following log rafting areas need to be included:

- additional nearshore areas by Louisiana-Pacific,
- additional nearshore and offshore subtidal areas by Manke Lumber,
- additional nearshore and offshore subtidal areas by Dunlap Towing and Weyerhaeuser, and
- additional offshore subtidal areas by Tacoma Boat Building

These additional log rafting and handling areas have been identified by the Wood Debris Group fairly recently and have been accepted by EPA and Ecology as valid. Accordingly, the Trustees should include these areas to be consistent with the most current and valid data.

Wood Debris Areas:

In determining diminished habitat due to wood debris, the Trustees relied only on information in Figure 5.3 from the Events 1A and 1B Data Report prepared for the Hylebos Wood Debris Group. See Attachment 7 to review all figures referenced in this discussion. Figure 5.3 illustrates the percent wood debris coverage based on photographic analysis of discrete samples (from a grid pattern) that were brought to the surface. In contrast, Figure 5.22 illustrates a synopsis of many sources of information relating to wood debris accumulations as compiled by the Wood Debris Group. For instance, Figure 5.8 identifies wood debris coverage based on a video surveillance along a number of transects and essentially provides more data points. The Wood Debris Group acknowledges that some of the transect lines went between grid points and found high accumulations missed by the grid sample pattern.[8] Figure 5.9 identifies areas with submerged logs based on video surveillance and side-scan sonar. Figure 5.4 presents Total Volatile Solids concentrations.

Combining the above data, Figure 5.22 illustrates areas with "low to moderate" and "high" wood debris accumulations.[9] Areas in yellow are presented as high wood accumulation areas and areas in gray as low to moderate wood accumulations. According to the Wood Debris Group's own criteria, all the areas in yellow **and gray** qualify as high wood debris accumulations exhibiting more than 50% wood debris.

Diminished Habitat Related to Moored Platforms.

The permanently moored platforms used by General Metals should be viewed similar to an overwater structure such as a log raft. These platforms attach to dock structures that either allow no intertidal habitat, or totally shade intertidal habitat. While the moored platforms do not result in wood debris accumulations, they do result in substantial shading of the narrow band of water between the platforms and the dock such that no functional intertidal habitat can exist. Thus, the area related to these platforms in Segment 2 should be included in the diminished habitat area. Figure 6.11 from the Events 1A and 1B Draft Data Report (Attachment 7) illustrates the location of these platforms.

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[8] See, Wood Debris Group Events 1A and 1B Data Report at 5-11.

[9] Most of the additional area for high wood accumulation (as compared to Figure 5.3) is primarily the result of video surveillance by the Wood Debris Group (Figure 5.8).

Inclusion of the three additional diminished habitat areas considered above would increase the diminished habitat in Segment 1 from 12.9 acres to about 20 acres. Similarly, Segment 2 diminished habitat would increase from 3.8 acres to about 6 acres. The above estimates are based on comparisons of figures 10-7 and 10-9 in Appendix E of the Settlement Proposal and Figure 5-22 from the Wood Debris Group Report. Due to the limitation of data provided by the Trustees, a more accurate estimate of increased diminished habitat area and the related decrease of DSAYs is not possible.

11. The Sediment Trend Analysis generated specifically for the Hylebos Waterway should replace the erroneous transport mechanisms assumed by the Trustees.

The Settlement Proposal uses broad brush assumptions to determine the sediment distribution in the Hylebos Waterway. Appendix 5 to Appendix H presents a regression analysis used to generate distribution factors. At page A5-4, it is acknowledged that "for sources in Segments 2, 3, and 4 a bi-directional distribution **is assumed**." (emphasis added). However, such an assumption has no technical basis and is indicative of inadequate data regarding the sediment transport processes in the waterway.

In 2001, GeoSea Consultants from British Columbia performed a detailed sediment size analysis of approximately 240 stations in the Hylebos Waterway. This analysis supported a detailed sediment trend analysis ("STA") that identified net sediment transport and dynamic sediment behavior in the waterway. The analysis is attached to these comments in its entirety. (See Attachment 8). The STA demonstrates that sediments move primarily to the southeast rather than bi-directionally as assumed by the Trustees. See Attachment 8 at Fig. 6. Consequently, all bi-directional distributions assumed for Segments 2, 3, 4 and 5 must be modified to reflect a single directional distribution to the southeast. For example, the directional distribution for Segment 3 sediments should include Segments 1 and 2, not Segments 2 and 4. Further, as indicated by the transport directions in the STA, allocation of PAHs from the Kaiser Ditch should be limited to Segment 1 and the neck of the waterway near the Kaiser ditch in Segment 2. PAHs from the Kaiser Ditch should not be evenly distributed between Segments 1 and 2, especially given that Segment 2 includes the middle (or lower) turning basin, and PAHs from Kaiser Ditch are not transported in that direction at all.

The Trustees are strongly encouraged to incorporate the STA data into their Proposal and to modify the allocation accordingly. These data present the actual distributional behavior of the sediments. Thus, the Trustees can now use a scientifically valid basis to determine sediment distributions instead of the erroneous assumptions currently applied.

12. <u>The Port of Tacoma, as the owner of the injured sediments, should receive an allocation specifically as to those sediments.</u>

While the Port of Tacoma is allocated damages as to Port sites adjacent to the Hylebos Waterway, an additional allocation is warranted with respect to the Port's ownership of waterway sediments. Through its operations, the Port has leased its waterway property and profited from the various activities that have contributed to the contamination. Thus, it is reasonable to treat the waterway itself as a property subject to allocation. The criteria by which this property would be allocated a portion of damages would necessarily differ in some respects from properties adjacent to the waterway. Nonetheless, the Port should be allocated a portion of damages since the Port was an actor in causing injury to the sediments directly due to its ownership of the waterway. Furthermore, the Port stands to benefit from the remediation of the waterway since the waterway will be dredged to navigation depths. Thus, if not allocated a portion of damages, the Port will actually benefit from its contribution to sediment injury. It is on such a basis that the TLI allocation assigned the Port a 7.51% share of open access remediation costs solely due to its ownership of the sediments. The TLI allocation recognized that the Port incurs a benefit in the amount it would normally pay for navigational dredging projects which will be performed during the cleanup.